

# **Ordnance Artifacts at the Sand Creek Massacre Site**

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A Technical and Historical Report

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## **The Sand Creek Massacre**

During the Summer of 1864, an Indian uprising raged across the southern plains of Colorado. During this, the third year of the Civil War, volunteer troops from the states had largely supplanted the regular army garrisons in the territories west of the Missouri river. These troops were, on average somewhat less disciplined and much less grandly equipped than the soldiers fighting in the east.

The Civil War began in Colorado Territory with the invasion of New Mexico by Brigadier-General Henry H. Sibley's Confederate army of Texas. Major E.R.S. Canby, commanding the district of New Mexico, placed an urgent call for help to the territorial governor of Colorado. The response by then territorial governor, William Gilpin, was the formation of the First Colorado Volunteer Infantry Regiment. Unauthorized and unfunded by Congress, the First was equipped by any means practical including purchase of equipment and arms on the civilian market by promissory notes on the Treasury of the United States which, it turned out, were unauthorized.

In the course of the New Mexico campaign, the First Colorado Infantry marched to Fort Union, New Mexico where they re-equipped, probably drawing from the stores at the Fort Union depot such military arms as were available there. It is logical to suppose that these arms would have been the earlier infantry type rifles which had been relegated to the depots of the west and placed into reserve in the east. These

probably included Model 1842 muskets and/or 1842 rifle muskets. It could have included arms as old as 1816 muskets and musket conversions. These arms were all of .69 caliber and would fire ball or buck and ball loads or in the case of rifled arms, a .69 caliber conical ball.

Following the Union victory at Glorieta Pass and the subsequent expulsion of the Confederate army from New Mexico, a request was made by Colonel John M. Chivington, then commanding, that the First Colorado Infantry be converted to a cavalry regiment and sent east to fight in the great battles of the east. The first request was granted and the First Colorado Infantry regiment became officially known as the First Regiment of Colorado Volunteer Cavalry. The second part of the request was, however denied. It was deemed necessary for the First Colorado Cavalry to protect the lines of communication into the gold fields of Colorado.

Not much is now known about the initial arming and equipping of the First Colorado Cavalry. It would probably be safe to assume that the men retained the infantry rifles and muskets that they had carried as foot soldiers, however. This was a fairly common practice during the initial stages of the war when cavalry arms and indeed arms of any type were in critically short supply. It was during this period that arms buyers from both the Union and the Confederacy fanned out across Europe, purchasing as many firearms as possible either to arm their own armies or to deny the same arms to the other side. The arms buyers of America cleaned out the arms rooms of Europe and in the process, amassed enormous quantities of very poor quality weaponry. Much of this junk was inflicted upon the troops in the territories and the Trans-Mississippi states.

By 1864, however, many of the volunteer regiments in the territories had managed to secure fairly good weapons. This was accomplished, mostly through supply from the National Armory or one or more of the private arms manufacturers who contracted with the U. S. government or one of the states. Todd's order of battle<sup>1</sup> shows the 1<sup>st</sup> Colorado Cavalry Regiment as having been armed with Starr carbine and Austrian jaeger short rifles and Remington and Starr revolvers by 1864.

The Cheyenne and Arapaho who were the rightful owners of the great plains area between the Platte and Arkansas rivers were also undergoing a rearming during this period. The traditional bow and arrow was still in widespread use and all Indian warriors were extremely proficient with its use but the younger men of the tribes were becoming increasingly better armed with firearms.

During the summer of 1864, tensions rose as units of the First Colorado Cavalry clashed on several occasions with parties of Cheyenne and Arapaho and possibly Sioux. As one author<sup>2</sup> so aptly described the situation; "retaliation by both sides had a perverse way of falling on the first adversary at hand, often some party entirely innocent of any fault." The massacre of the Hungate family on Box Elder creek on June 11 of that year brought tensions near the breaking point. Territorial Governor John Evans issued an edict authorizing the killing of "hostiles" and the citizens and soldiers of the territory were engaged in nearly daily conflicts with bands of Cheyennes and Arapahos.

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<sup>1</sup> Todd, Frederick P. *American Military Equipage, 1851 - 1872, Volume II, State Forces*, Chatham Square Press, Page 672.

<sup>2</sup> Alan W. Farley in his introduction to *The Battle of Sand Creek* by Morse H. Coffin.

In the midst of this turmoil, Major Edward W. Wynkoop, commanding the garrison at old Fort Lyon on the Arkansas river was approached by three Cheyennes carrying a note signed by "Black Kettle and other Cheives (sic)" which may have been an overture towards peace. In response, Wynkoop left the safety of Fort Lyon and ventured out onto the plains towards the Smoky Hill river with his small command and two mountain howitzers until he found Black Kettle's camp. There, despite threats by the more militant in the village, a council was held, with Black Kettle promising the return of white captives if a council could also be held with the Governor and the military.

This council in Denver has become known as the "Camp Weld Conference" and was attended by several of the more prominent "peace chiefs" of both the Cheyenne and Arapaho tribes including Black Kettle and White Antelope and by Governor John Evans and Colonel John M. Chivington representing the whites. Accurate notes of the conference were evidently not taken and there is yet some controversy about what was actually said and by whom. Near the conclusion of the conference, Chivington received a wire from General Curtis, commanding the Military District, directing Chivington to not make peace yet. This probably suited Chivington quite well as he had under his command, the newly formed Third Regiment of "Indian fighters" which had been enlisted to put an end to the Indian troubles once and for all.

The Third Colorado Volunteer regiment of cavalry had been recruited from the Denver area as well as in the gold fields to the west and south. The members of the regiment were a strong sampling of men in a frontier mining community. They had

enlisted for 100 days service to fight Indians but as time passed, they failed to receive even the weapons and other equipment to fight with. Finally, in November of 1864, Chivington was able to arm and equip about seven companies of the Third and start them on the way to Fort Lyon. Near Pueblo, Chivington met and assumed command of the force which included most of the Third regiment with several partial companies of the First Cavalry and led it into Fort Lyon, arriving there on the afternoon of the 28<sup>th</sup> of November.

Holding a meeting with the officers at Fort Lyon, Chivington was faced with an entirely different feeling about the Indians camped on nearby Sand Creek than he had anticipated. One faction, headed by Captain Silas S. Soule was adamantly opposed to attacking the village, claiming it was there under the protection of the United States by orders of Major Wynkoop. Major Scott J. Anthony, who had replaced Wynkoop but a few weeks earlier suggested to Chivington that the camp on the Smoky Hill should be the target of any attack which was to be made.

Chivington, however, was also adamant. Marching his Third Colorado Cavalry troopers with their two 12-pounder mountain howitzers out of the post at nine-o'clock in the evening, he was accompanied by several abbreviated companies of the Colorado First Cavalry which were posted to the fort and the post's two mountain guns. Arriving on Sand Creek just before dawn the next morning, he immediately attacked Black Kettle's sleeping village. The Indians fled as best they could, some up the stream bed to the northwest and others out onto the prairie to the northeast in the direction of the Smoky Hill encampment. The men formed skirmish lines and desperately held the troops back until the women and children could flee. Despite

their best efforts, a large number of non-combatants were killed and it is generally conceded that there was wholesale scalping and other mutilations of the bodies.

Chivington and the Colorado Third returned to Denver to heroes welcomes that soon turned sour. Accusations were leveled that the village had been peaceful and that the attack was a massacre of helpless women and children. Colorado was facing a statehood vote in which Chivington was one of the principals, a candidate for congress. Political enemies, eastern humanitarians, and others who had one thing or another to gain soon enlisted members of congress and two congressional panels were seated to investigate the charges leveled against the Colorado troops. The Army also empanelled a board to inquire into the conduct of the Sand Creek campaign. The findings of the two congressional probes were inconclusive but in any case, because Chivington was not invited to attend or allowed to furnish witnesses on his own behalf, any findings must be held somewhat suspect. The military panel, which was chaired by Chivington's avowed enemy, Lieut. Col. Samuel Tappan, was highly critical of Chivington's actions but because of Tappan's presence as chairman of the panel, the integrity of this panel must also be found in question. In any case, the findings were moot as the enlistments of the men and the commissions of the officers of the Third regiment had expired by this time.

## The Battlefield Revisited

In December of 1864, about a month following the massacre, Major Edward W. Wynkoop on his way to assume command of Fort Lyon, visited the site of the battle. He reported the grounds still "covered with the ghastly remains of the victims".

In June of 1868, 1<sup>st</sup> Lieutenant Samuel Bonsall was ordered to escort General W. T. Sherman from Fort Lyon to Fort Wallace. This escort party with Sherman spent the night at the site where they gathered a wagon load of artifacts which Sherman had shipped back east on the railroad. Bonsall later gathered and donated to the Army Medical museum, two more skulls identified as Indian and having been found at the Sand Creek site.<sup>3</sup>

In 1908, four former members of the Colorado Third Volunteer Cavalry Regiment (100 days) arrived by train in Kit Carson, Colorado. They were escorted down Big Sandy creek in two wagons with drivers and a reporter from the Rocky Mountain News. The rather flowery account written by the reporter seems to indicate that two days were spent somewhere south of Kit Carson without anyone agreeing that the correct site of the engagement which the four had participated in forty-four years

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<sup>3</sup> Surgeon General's Office, Army Medical Museum, *Records Relating to Specimens Transferred to the Smithsonian Institution*, 1990. (See The Sand Creek Massacre Site: A Report on Washington Sources by Gary L. Roberts.)



earlier had been found. Several natives pointed out other sites but, according to the reporter, none could be confirmed.<sup>4</sup>

In 1997, Richard Ellis of Fort Lewis College was awarded a grant from the Colorado Historical Society to locate the site of the engagement. Six days were spent investigating two sites on Big Sandy creek. Several artifacts were found on each of the sites but no conclusion was reached concerning the correct site. To establish if the correct site(s) was being considered, several methods are used. Visual search methods were not successful due to the great intensity of previous searches over many years. Metal detector searches were then begun. Ground penetrating radar was available but was not adequately utilized. All artifacts found in this survey were recovered as a result of the use of metal detectors operated by amateur operators. Subsequent geomorphologic tests have established that the possibility exists that possibly 20 centimeters and even as much as 30 centimeters of soil have filled in upon the area during the past 134 years and most artifacts could therefore be at or below maximum metal detector depth. In spite of these and other difficulties, several significant items were located as are described in Appendix A.

In his as yet incomplete report of the survey, Ellis made several recommendations regarding site location:

1. A geomorphologic study should be made of the Dawson location.
2. A concerted effort should be made to locate and study artifact collections purportedly found at the Sand Creek Site.

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<sup>4</sup> *Veterans of 1864 Revisit Scene of Indian Battle on the Banks of Sand Creek, Colo.* By C. E. Van Loan (Denver Post, July

3. An intensive program of non-intrusive sensing should be made of the Dawson site.
4. Metal detection should be continued on both the Dawson property and other properties along Sand Creek as other research dictates.

In 1998, a bill was introduced in the United States Senate by Senator Ben "Nighthorse" Campbell of Colorado and was signed into law by President Clinton. This bill mandated the National Park Service to locate and identify the site of the 1864 Sand Creek Massacre. The expertise and resources of the National Park Service were significant assets in this study. It was their initial response that artillery shell fragments must be yet present in some areas that has most influenced this report. Although the site can and possibly will be located through the utilization of other means, the finding of ordnance relics would be one of the most significant "proofs".

To understand the significance of ordnance "finds", one must know the types and calibers of weapons in use during the mid-1860's by both military and Native American combatants.

## **The Armament of Colorado Volunteer Forces**

When the Civil War began, there was a general scramble by both sides to locate and clean out the armories of Europe of their vast hordes of surplus weapons. Some of these were of excellent quality but were large, clumsy, and non-standard so far as priming methods and chamber dimensions were concerned. General John C. Fremont, the newly appointed commander of the Military District of Missouri, made one of the first arms buying expeditions to Europe. Upon taking office Fremont was shocked to discover that the United States Arsenal in St. Louis had no modern weapons and very few of any other kind. Therefore, Fremont embarked on an arms buying venture for which he was later to suffer severe criticism. Fremont's acquisitions included a large number of muskets generally lumped together under the heading "Austrian".

The Austrian muskets purchased by Fremont were variously .69 and .71 calibers, the latter sometimes called "Garibaldi" rifles because of the use of some of these rifles in the North Italian states during the Garibaldi revolutions. Garibaldis are typically massive, well made muskets of large caliber. Some of what he purchased were .71 caliber Austrian rifled muskets employing an Augustin Consol type of tube-lock primer. These were rapidly converted to the more common (in America) musket cap percussion type primers.

Soon after the acquisition of the Austrian rifles, Fremont became involved in the purchase of Halls carbines for his cavalry. The Hall was a .52 caliber breech-loading carbine which was initially introduced into cavalry service in the 1820's. This particular lot had been manufactured in 1849-52 and had never been put into service. General Ripley, the Union Ordnance chief decided to sell these carbines as unserviceable in May of 1861 in spite of the shortage of all types of weapons at the time. The Hall's were purchased by A. M. Eastman for \$3.50 each who, knowing of Fremont's immediate need for cavalry arms, offered the lot to Fremont for \$22.00 per carbine. Fremont accepted the offer but the press, ever alert to scandal, made much of the deal. In effect, Ripley ended Fremont's career in the West by this sale.

Fremont's troops in Missouri were armed with the Austrian weapons until more serviceable arms could be procured. There is every indication that these arms served the Missourians well during their term of service.

At some point, Colorado Territory received a number of "Garibaldi" muskets, reportedly from Fremont's acquisitions. The exact number is unknown but various mentions of Garibaldi rifles is made in Special Orders for 1864.<sup>5</sup> Territorial Governor John Evans authorized the issue of 15 Garibaldi rifles to Solomon<sup>6</sup> under Special Order 43, paragraph 1. Paragraphs 2 and 3 of the same order also authorized

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<sup>5</sup> See Appendix B.

<sup>6</sup> The order states in its entirety, "Upon request of his Excellency, Gov. John Evans that Mr. Fred Z. Solomon be furnished (15) Garabaldi rifles with 50 rounds each of ammunition for defense of his train. It is ordered that the District Ordnance Officer turn over said stores to Mr. Solomon and take his memorandum receipt for the same. By order of J. M. Chivington, Col. 1<sup>st</sup> Cav. Of Colorado, Commanding District" This order (No 43, Part 1) is dated June 14, 1864. Part 2 of this order allowed Mr. D. E. Oakes to be furnished 12 Garabaldi rifles with 50 rounds each of ammunition to be used for defense of his train and Part 3 allowed Mr. M. A. Christian 12 Garabaldi rifles with 50 rounds each of ammunition for defense of his neighborhood. (RG393 - Special Orders - Nov. 1862 - Sept. 1865 - Dist Of Colorado, Vols. 340/811 -331/789, National Archives, Washington, D.C.)

twelve each to Oakes and Christian. S. O. 47, paragraph 3 authorized 3 Garibaldi rifles to Scott "for protection against Indians". Colonel John M. Chivington commanding the district authorized himself to draw 85 Garibaldi rifles between August 1 and August 3, 1864.

S. O. 89 dated September 15, 1864 shows that 500 "friction tubes" were issued to Captain Morgan's H Company. If these were for friction primers for the two Mountain Howitzers, this seems to be a very large supply. Could these be primer tubes for the Austrian Augustin-lock found on the Austrian Model 1840 muskets which Fremont purchased in Europe? Most of these were converted to the American percussion musket cap but some might have escaped the conversion.<sup>7</sup>

Colorado volunteer troops also drew 900 U. S. .69 caliber rifled muskets as a result of the "President's Calls of 1862<sup>8</sup>". These were undoubtedly the Harper's Ferry model of 1842. Returns show that at least some of these weapons were on hand for the entire war whether used or not. Mississippi rifles of caliber .54 were also available from some source and Special Order 67 shows that Colonel Chivington authorized himself 60 Mississippi rifles in 1864.

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<sup>7</sup> Research at both Springfield Armory NHS and the West Point Museum by the author seems to conclusively put this theory to rest. John McCabe, Curator at Springfield Armory states that only three examples of the "tube lock" are known to have survived. One is at the armory and was examined. Mr. Robert Fisch of the West Point Museum states that the terminology for "friction tubes" would have been correct for the mountain howitzers. He further stated that the number issued (500) would not have been an unusually large number of issue during this time period.

<sup>8</sup> The formal title was "Ledger of Issues of Ordnance and Ordnance Stores to the Loyal States Under the President's Calls of 1862." (Record Group 156 (Records of the Office of the Chief of Ordnance) , National Archives, Washington, D.C.)

There were, however, enough Austrian and Belgian antiques in the District Ordnance Department in August of 1864 to arm companies B and D of the Third Cavalry which were forming. Somewhere around the last of August an ordnance train arrived but it is not known what weapons were on it. Other trains were enroute during this time and yet another was stranded at Fort Lyon by the loss of their mules to the Indians. Chivington and Evans attempted to get authorization to remove supplies from this train, bound for New Mexico, but the results of this attempt are unknown. During this entire period, numerous transfers of weapons and ammunition from the various posts in the district were intended to furnish arms for the new regiment. By late September, most members of the regiment had received a weapon of some type.

In Lt. C. C. Hawley's testimony to the military commission on February 24, 1865<sup>9</sup>, he testified that as Acting Ordnance Officer he had issued to the regiment 772 rifles (.54 caliber) and 58 Starr's carbines<sup>10</sup>. The 772 rifles included the Austrian and Belgium muskets, a number of "Mississippi rifles" (Model of 1841 Harpers Ferry)<sup>11</sup>, 224 Harpers Ferry Muskets (.69 caliber) which could have been as old as 1835 models converted from flint to the 1842 model percussion musket<sup>12</sup>. Also listed were 16 muskets (.71 caliber), 28 Sharps carbines (no caliber given), 5 Colt's repeating

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<sup>9</sup> Senate Exec. Doc. Nov. 26, 34-38

<sup>10</sup> This carbine was a .54 caliber breech loading, percussion fired weapon. There is some conflict in the testimony as he states 58 weapons were issued yet 169 were returned.

<sup>11</sup> Hdqtrs., 3<sup>rd</sup> Colo. Cav., S. O. No. 60, Nov. 22, 1864, "Records, Third Colorado Cavalry", 51.

<sup>12</sup> Ibid., pp. 159-62, 167-69, 221.

rifles (.44 caliber), 2 Colt's Army revolvers (.44 caliber), 29 Starr revolvers (no caliber given) and 72 Whitney revolvers (no caliber given).

The First Colorado was a bit more grandly armed if only because they at least were armed with cavalry carbines instead of the unwieldy infantry guns issued to the bulk of the Third regiment. An inspection report by Major Scott J. Anthony, dated August 31, 1864 while he was in command of Fort Larned, Kansas shows that four companies of the First were armed as follows:

Company B was armed with Starr's carbines and Starr's or Colt's .44 caliber revolvers.

Company F was armed with Sharps carbines and Colt's Army revolvers.

Company L was armed with Starr's carbines and Colt's Army revolvers.

Company M was armed with Starr's carbines and Colt's Army revolvers.

All companies were additionally armed with the model of 1860 cavalry saber which in the archaic cavalry tactics of the period was listed as the cavalryman's primary weapon.

Although they were armed with cavalry carbines, they weren't necessarily better armed. The Sharps carbine was generally recognized as a first class weapon but the Starr was not well liked by most troopers and their commanders. A Captain G. G. Norton<sup>13</sup> complained that: "There is too great a distance from cap to cartridge.

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<sup>13</sup> *Army Officers Reports, Senate Executive Document 26, 39<sup>th</sup> Congress, 2<sup>nd</sup> Session, Serial No. 12277.*

Often fail to snap a cap and by no means a sure and effective weapon". Colonel Cesnola of the 4<sup>th</sup> New York rated the Starr of little or no use. In July of 1864, Captain Preston of the 2<sup>nd</sup> Missouri with 339 Starrs complained of frequent misfires with the same ammunition furnished for the Sharps. This was also reported by Captain James Green of the 12<sup>th</sup> Missouri Vol. Cavalry who stated that they "hung fire and often took three or four caps to fire the paper cartridge, defects that were mostly in the weak mainspring and the tube to carry the fire to the cartridge which was too long and the passage too crooked." Several companies of the First Colorado Cavalry carried the Starr carbine at Sand Creek. During the months proceeding the massacre, First regiment troopers had an opportunity to test the reliability of the Starr and had found it sorely wanting. Major Edward W. Wynkoop reported<sup>14</sup> in August of 1864 that "the carbines with which our regiment are armed are absolutely worthless, it being impossible to discharge over two thirds of them. I am obliged to depend almost altogether on the pistol and saber, and you are aware that a large number of the men are without pistols." The above listing shows that at least three companies of the Colorado First cavalry was armed with the Starr as was most of the Colorado Second. Regimental inventories for the summer and fall of 1864 show the Second Colorado as having 86 Merrill and 805 Starr carbines. These same inventories list the Third as having 58 Starrs. However, records show that the 3<sup>rd</sup> Colorado turned in 17 Sharps carbines and 169 Starrs in early 1865.<sup>15</sup>

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<sup>14</sup> O. R. Series I, Volume XLII/1 (S#83) Page 237.

<sup>15</sup> Frederick H. Dyer, *A Compendium of the War of the Rebellion*, Dayton, Ohio, 1978, p. 1386.



While the various companies were issued whatever government arms were available, some of the individual members found ways to better their armament. Morse Coffin's company (D)<sup>16</sup> was posted at Valley Station<sup>17</sup> to help keep the northern route into the territory open. Coffin gives us some insight into the armament of both the troops and the Indians during the months preceding Sand Creek. Coffin describes an engagement with two lodges of Cheyennes by 30 troopers of the Third Colorado. Following this lop-sided affair, Coffin describes the weapons collected at the camp as "a Lancaster rifle, so common among Indians, the other an army carbine, such as were used by the seventh Iowa Cavalry,<sup>18</sup> some of whom were at Julesburg." In his letter describing the events of October 12, 1864, Coffin tells of his company obtaining firearms. He describes it thusly: "The boys soon found these teamsters had some good revolvers they were willing to part with for from \$20 to \$40, according to size and quality. As many were purchased as the other parties would sell. And this buying of arms continued as occasion offered until I estimate that at least \$3,000 was paid out by the boys of Company D for arms and ammunition for ourselves, as we had to buy our own ammunition for both the carbines and revolvers we bought."

He continues: "Good arms were in demand, and high at that time, and for Smith & Wesson carbines we all paid \$40, without cartridges, and the same price for navy

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<sup>16</sup> Captain David H. Nichols, commanding.

<sup>17</sup> Valley Station was just west of present day Iliff, Colorado and across the Platte river.

<sup>18</sup> The Seventh Iowa was armed with Gallager carbines which they very much disliked.

revolvers.<sup>19</sup> Since Mr. Smith and Mr. Wesson had yet to go into partnership manufacturing carbines, the arms described by Coffin were either Smith carbines of which the government eventually purchased over 30,000 during the course of the war or the Wesson carbine of which procured quantities were considerably less.<sup>20</sup> Later in his letters, Coffin describes an incident at Sand Creek in which he engaged a solitary Indian in a long range duel. Coffin writes: "my gun - a Smith & Wesson carbine - became so foul that an empty shell stuck fast in it, which all my efforts failed to remove, and I also spoiled the little concern used for that purpose."<sup>21</sup> I hadn't yet learned that by wetting the shells in the mouth immediately before firing they could be easily removed with the thumb and finger".

The carbine designed by Gilbert Smith and manufactured by the Massachusetts Arms Company was of .52 caliber and used either a rubber or foil cartridge case. Troops reportedly had trouble with the rubber cartridge cases "vulcanizing" when the barrel became hot leaving the soldier with a problem of extraction.<sup>22</sup> The foil case was supposed to partially collapse upon firing thus making extraction with the fingers easy. The Smith carbines as well as the Maynards, Burnsides and Gallagher carbines had no mechanical extractor. Extraction was by simply pulling the fired

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<sup>19</sup> The term "navy revolver", referred at the time to a revolver of .36 caliber. Those of .44 caliber were referred to as "army revolvers".

<sup>20</sup> Government acquisitions of the Wesson carbine were only 151 carbines during the entire war. Much larger quantities were procured by state purchasing agents and by individuals.

<sup>21</sup> Two military model Wesson carbines were examined by the author at Springfield Armory. Neither were fitted with any type of extractor. A civilian "Sporting model" examined at Gettysburg NHS and part of the Rosensteel collection is fitted with a rather delicate manual extractor mounted to the side of the barrel on the right side of the weapon. This is undoubtedly the "little concern" described by Coffin.

<sup>22</sup> Firing tests by the author showed no problems of extraction with the Smith carbine. Although the barrel gets uncomfortably warm at the breech after firing several rounds, extraction was simple. Due to the recess in the breech, nearly one-third of the rubber cartridge protrudes from the barrel and getting a grip on the cartridge is relatively easy. The much thinner foil cartridge case would present even less of a problem as it tended to partially collapse upon firing.

case out with the finger and thumb, a feat easier said than done after the barrel had become hot from firing.

The Wesson military carbine was designed by Frank Wesson, a brother of Edwin and Daniel Baird, makers of revolvers. This design was a tip-down barrel action having two triggers and guards. The front trigger was the release for the action. The military carbine fired a .44 caliber rimfire cartridge of which nothing more is known. It is thought that this is the carbine described by Coffin as he makes no mention of either rubber or foil cartridges. Civilian or sporting model carbines have been observed in calibers ranging from .32 to .44 inch.

Four mountain howitzers accompanied the troops to Sand Creek. In a cavalry regiment, it was common practice to assign the guns to a company and assign men in that company to be trained as gun crews. Gunners in a cavalry company were normally not nearly as proficient as those in artillery batteries.

The guns supplied to the force which attacked Black Kettle's village at Sand Creek were 12-pounder mountain howitzers. The "12-pounder" denoted the nominal projectile weight and the bore diameter was the same - 4.62 inches - as the Napoleons used in the east. However, these little guns had a tube length of only 30.91 inches. They fired three basic types of ammunition - cased, shell, and canister.<sup>23</sup> Grape, although mentioned by several of the participants of the battle was not in common usage during this time period. The greatest difference between

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<sup>23</sup> See appendix B.

the mountain howitzer and other smoothbore cannon of the period was its physical size.

Initially made to be broken down into three loads for pack animals the tube was more commonly mounted on a "prairie carriage" and pulled behind a single horse. Later models had a single pole and was pulled by two horses. Of relatively light weight - a gun with carriage weighed only 537 pounds - these guns had a rather vicious recoil<sup>24</sup> with a normal load of ½ pound of black powder. Shot was not normally used with this gun.

Two ammunition boxes accompanied each gun and could be packed on a horse or mule or were, more commonly mounted on a limber. It is not known if the Colorado troops were supplied with limbers. Each ammunition box contained room for 8 rounds of fixed ammunition. Regulations called for a mix of one round of canister, one round of Spherical case shot, and six rounds of shell in each ammunition box.

Spherical cased shot was the most effective and therefore the most commonly encountered. A round of case was simply a hollow iron ball which was filled with .69 caliber round musket balls and fitted with a bursting charge and fuze. Sulfur was used to fill the space between the balls and further act as a booster. The most

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<sup>24</sup> William A. Kupke in his *A History of the Mountain Howitzer* quotes Bruce Krohn of the Artillery Company of New Mexico whose group participates in live fire at Fort Sill as saying "Mountain Howitzers have a free recoil velocity of about 15 ft/sec or about 10 mile per hour. Think of getting your 500 pound gun up to 10 mph and trying to stop it! Another comparison: imagine one man trying to stop a full 55 gallon drum of oil dropped from five feet. If a man tries to stop a weigh three times his own, traveling 10 mph, he will bounce of at three times the speed or 30 miles per hour. This will hurt you." Krohn also wrote that most old army data on muzzle velocity was far off. Only the 1852 chart of Mordecai was near accurate. It stated that the spherical case shell fired from a Mountain Howitzer had a muzzle velocity of 640 feet/second.

General Gibbon in his 1860 *Artillerist's Manual*, wrote on page 250: "The Mountain Howitzer will recoil 11 or 12 yards, but may be limited to 4 by using a rope on the wheels." Kupke notes that the prairie carriage #3 kept a rope (prolonge) on the top of the trail stock for this purpose.

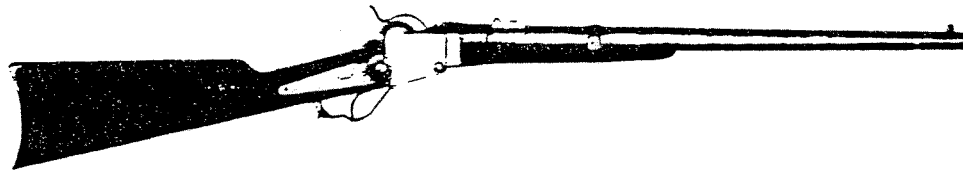
common fuze type was the Bormann. Range of spherical cased shot in a Mountain Howitzer was 800 yards at 5 degrees elevation.

Spherical shell was also commonly used. It was roughly the same as the cased shot without the .69 caliber musket balls inside. The wall thickness for shell was .7 inch (tolerances allowed ranged from .66 inch to .74 inch) and for Spherical case was .45 inch (.425 inch to .475 inch). Some spherical shell was made with segmented sections which produced a larger number of fragments upon bursting. Spherical shell had a greater range than cased shot. The gunners card shows 1005 yards at 5 degrees elevation.

The third type of ammunition used was canister. Canister was simply a large tinned can filled with .69 caliber lead musket balls which fired as a gigantic shotgun. There are recorded instances of double and triple charging with canister but this greatly increased the risk of tube rupture and the attendant risk to the gun crew. Multiple charging with canister was only done when massed bodies of troops were attempting to capture the guns. Canister had an effective range of 200-250 yards against attacking infantry and probably had a maximum range of less than 400 yards. Canister was much more effective than grape due to the much denser pattern of shot. For this reason, by the time of the Civil War grape was almost exclusively relegated to use aboard naval vessels and used to cut rigging.

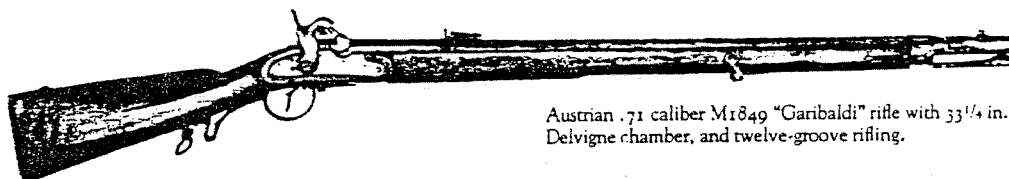
Mountain Howitzers were fired with a friction primer. Basically, a friction primer consisted of two thin copper tubes soldered together at right angles. The shorter of the two tubes was filled with a friction composition into which was inserted a copper

or brass serrated wire. The longer tube was filled with meal powder and sealed with wax. The fuse was inserted into the vent hole on the top at the rear of the tube. The hook on the firing lanyard was fastened to a ring on the end of the serrated wire and upon the command "fire" the wire was pulled through the primer compound which ignited the powder in turn firing the main charge. Upon firing, the friction primer was blown out of the vent and usually landed about fifteen feet behind the gun.



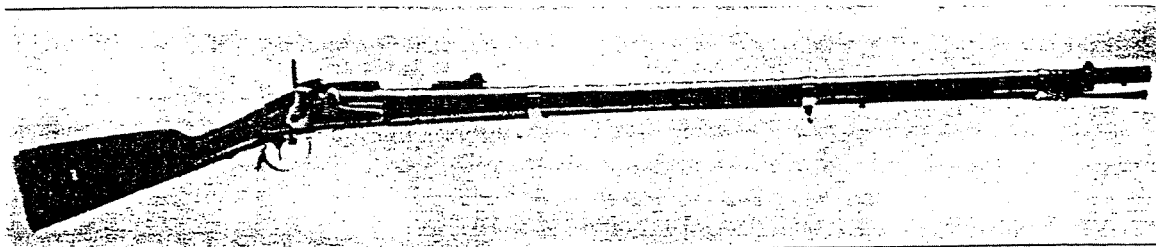
STARR CARBINE

Library - Sand Creek Historical Site



Austrian .71 caliber M1849 "Garibaldi" rifle with 33 1/4 in. barrel, Delvigne chamber, and twelve-groove rifling.

GARABALDI RIFLE



Catalog # 739 SPAR # 4684

Model/Designation: Merrill Breech Loading Conversion of a Model 1842 Harpers Ferry Musket.

Barrel: Caliber .69, rifled and 42" in length. Stamped, PB/P and V/P / Eaglehead. Long range rear sight.

Lock Plate: Stamped, Eagle/ US and, HARPERS / FERRY / 1855. On breech block, IAS. H. MERRILL, BALTO. / PAT. JULY 1858.

Stock: 55 1/4" in length. Cartouche is difficult to see.

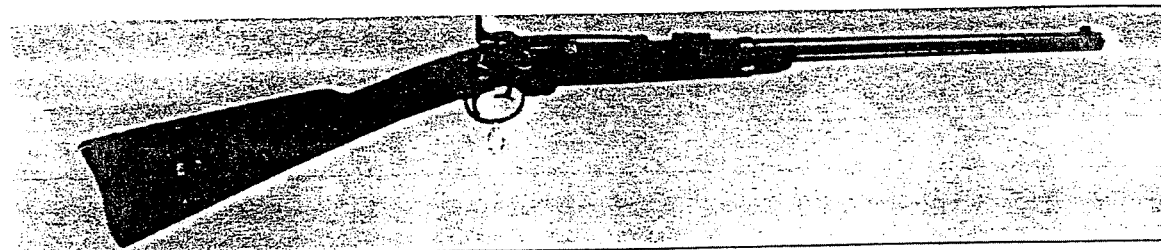
Other Facts: Only a few hundred M1842 muskets were converted around 1862. However, thousands of conversions were done on rifles & rifle-muskets.

HARPER'S FERRY MUSKET



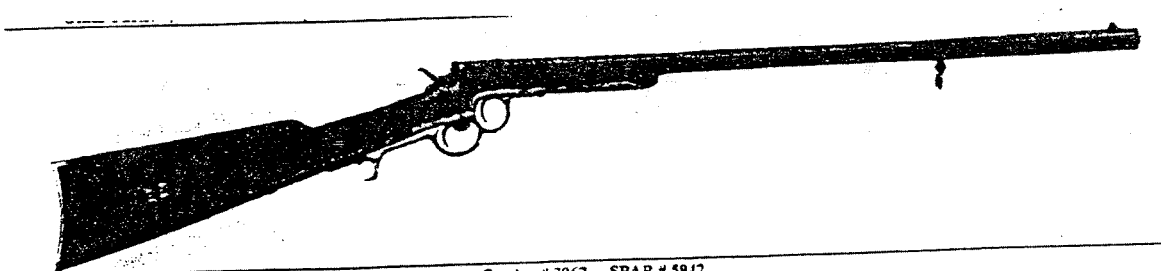
Catalog #24 SPAR # 4715  
 Model/Designation: U.S. Model 1841 Percussion Rifle, "Mississippi."  
 Barrel: Caliber .54, 7 groove rifling and 33" in length. Stamped, US/IP/CP.  
 Lock Plate: Stamped, ROBBINS / & / LAWRENCE / US and behind hammer, WINDSOR, VT. / 1848.  
 Stock: 43" in length. Brass mounted. Not cartouched.  
 Other Facts: Alteration done for Confederacy by J. H. Happholt of Charleston, S. C. Returned from the battlefields of the Civil War.

### MISSISSIPPI RIFLE



Catalog # 3090 SPAR # 6244  
 Model/Designation: Smith Carbine. Ser. # 30.  
 Barrel: Caliber .50 with 3 groove rifling. 21 5/8" round barrel. Open leaf ungraduated rear sight.  
 Frame: Stamped, ADDRESS / POULTNEY & TRIMBLE / BALTIMORE, USA. MT'd by American Machine Works, Sp'd, Mass.  
 Stock: 9" fore-arm stock. Mounted in iron. Total length of carbine, 39 1/2". 2 1/2" bar and ring on left side. Cartouched, HDH & JH.  
 Other Facts: Stock fire damaged. Additional stamping on the frame, SMITH'S PATENT / JUNE 23, 1857. 30,062 carbines were purchased for the Civil War.




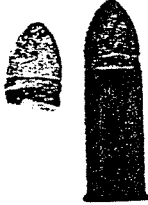
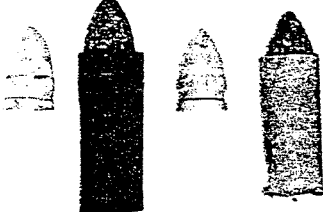
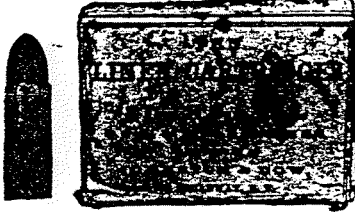
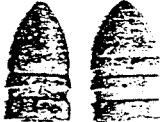


### SMITH CARBINE



Catalog # 3062 SPAR # 5942  
 Model/Designation: Wesson Carbine. Ser. # 4463.  
 Barrel: Caliber .44 with 5 groove rifling. 24" octagonal barrel. Stamped, F. WESSON'S PATENT.  
 OCT. 25, 1859 & NOV. 11, 1862 and B. KITTEREDGE & CO., CINCINNATI, O. Rear sight missing.  
 Stock: Butt stock only. Total length of carbine, 39 1/4". Sling swivels under the barrel and on the butt stock.  
 Other Facts: MT'd by F. Wesson of Worcester, Mass. 151 carbines were purchased by the U.S. Government during the Civil War.  
 Catalog/ SPAR #s for additional carbine study: Warner > 3184/1248 and Wesson > 3061/5943, 3063/5941.

### F. WESSON CARBINE



<p>1</p>  <p><b>.71 MINIE BALLS</b></p> <p>"GARABALDI" RIFLE</p>	<p>2</p>  <p><b>.69 MINIE BALLS</b></p> <p>HARPERS FERRY MUSKET</p>	<p>3</p>  <p><b>.54 MINIE BALLS</b></p> <p>"MISSISSIPPI" RIFLE</p>
<p>4</p>  <p><b>.42 Wesson Carbine Round</b></p>	<p>5</p>  <p><b>.50 Smith Carbine Round</b></p>	<p>6</p>  <p><b>.54 STARR CARBINE AMMUNITION</b></p>
<p>7</p>  <p><b>.52 CAL. SHARPS BULLETS</b></p> <p>FLAT BASE</p> <p>TWO TYPES</p>	<p>8</p>  <p><b>"RINGTAIL SHARPS"</b></p> <p>TWO TYPES</p> <p>.52 CALIBER</p>	<p>9</p>  <p><b>.54 CALIBER STARR BULLET</b></p>

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THE ABOVE ARE BOOKS AND ARTICLES WHICH I HAVE READ IN RESEARCHING THE SAND CREEK AFFAIR. ALL RELATE EITHER DIRECTLY TO THE SAND CREEK EVENT OR TO OTHER PERSONS OR EVENTS WHICH I BELIEVE ARE IMPORTANT TO THE UNDERSTANDING OF THE SUBJECT.

☉ DENOTES BOOKS OR OTHER ITEMS IN MY PERSONAL COLLECTION.

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CHIVINGTON, CO 81036  
(719) 729-3529

## PHOTO CREDITS / SOURCES

PAGE 24	STARR CARBINE	AUTHOR	CARBINE # 5936, SPRINGFIELD ARMORY
	GARABALDI RIFLE		<i>FIREARMS OF THE AMERICAN WEST</i>
	Harpers Ferry Musket		<i>1909 Catalog of the Springfield Armory Museum Arms &amp; Accouterments</i>
Page 25	Mississippi Rifle		<i>1909 Catalog of the Springfield Armory Museum Arms &amp; Accouterments</i>
	Smith Carbine		<i>1909 Catalog of the Springfield Armory Museum Arms &amp; Accouterments</i>
	F. Wesson Carbine		<i>1909 Catalog of the Springfield Armory Museum Arms &amp; Accouterments</i>
Page 26			<i>A Handbook of Civil War Bullets and Cartridges</i>
Appendix C			Big Hole National Battlefield

# APPENDIX A

## Artifact Find Locations - Ellis Archaeology - October 1997

Field Specimen #	Artifact Description	UTM Easting	UTM Northing
D-1	<b>.44-40 cartridge case</b> <sup>1</sup>	<b>0717302</b>	<b>4269928</b>
D-2	<b>.44 caliber bullet</b>	<b>0717304</b>	<b>4269930</b>
D-3	Arrowhead (bronze)	0717258	4270083
D-4	Picket pin (U. S. Model 1859)	0717105	4269895
D-5	Axe head	0717158	4269731
D-6	Silver fragment	0717009	4270114
D-7	Cut nail	0716985	4269911
D-8	<b>.45 Sharps bullet</b>	<b>0716869</b>	<b>4269966</b>
D-9	NOT USED		
D-10	<b>.54 caliber bullet</b>	<b>0716005</b>	<b>4273546</b>
D-11	Girth ring fragment	0715675	4275853

R-1	<b>.58 caliber cartridge case</b> <sup>2</sup>	<b>0704537</b>	<b>4279773</b>
R-2	<b>.58 caliber bullet</b>	<b>0704421</b>	<b>4279973</b>
R-3	<b>.58 caliber cartridge case</b>	<b>0704552</b>	<b>4279798</b>
R-4	<b>.44 caliber Henry cartridge case</b>	<b>0704561</b>	<b>4279768</b>

All ordnance artifacts are shown in bold print.

<sup>1</sup> Post dates massacre.

<sup>2</sup> Both R-1 and R-3 are inside bar primed .50-70 cases and are not .58 caliber as described. See *Cartridges For The Springfield Trap-Door Rifles and Carbines 1865-1898* by Walter P. Reuland, Heritage Concepts, P. O. Box 6121, Larime, WY. (Date not given)



# APPENDIX B

## ORDNANCE ISSUES TO 3<sup>RD</sup> COLORADO CAVALRY

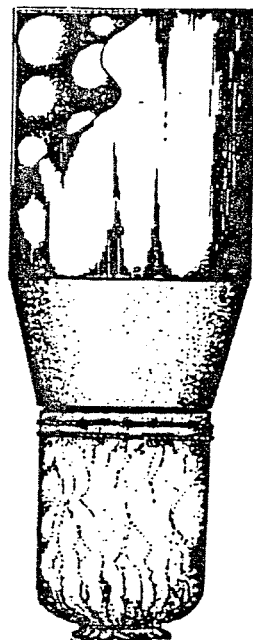
Special Order	Date	Ordnance		Ammunition		Caliber	Issued To	Company
		Qty.	Description	Qty	Description			
70	8/20/1864	98	Austrian Rifles	4000	Cartridges	.54	Hal Sayre	B
70	8/20/1864			2000	Cartridges	.36	Hal Sayre	B
70	8/20/1864			1000	Cartridges	.44	Hal Sayre	B
81	9/3/1864	100	"Stands of Arms and Equipments"	8000	Cartridges	?	T. Cree	A
82	9/5/1864	80	Harpers Ferry Muskets	1000	Cartridges	.69	A. Shock	A
84	9/7/1864	84	Harpers Ferry Rifles & Equipments	4000	Cartridges	.69	J. Phillips	L
84	9/7/1864	50	Harpers Ferry Rifled Muskets, etc.	4000	Cartridges	.69	CPT Worrall	Rec. Off.
84	9/7/1864	80	Austrian Rifles Cal. .54 & Equip.	4000	Ball Cartridges	.54	E. Chase	F
84	9/7/1864			1000	Navy Cartridges	.36	E. Chase	F
84	9/7/1864	88	Austrian Rifles	4000	Cartridges	.54	Hal Sayre	E
84	9/7/1864	6	Model U. S. 1840 Rifles	1000	Ball Cartridges	.54	D. Nichols	D
89	9/15/1864	91	Rifles and Equipments	4000	Cartridges	.54	W. Morgan	H
89	9/15/1864	500	Friction Tubes	2000	Cartridges	.44	W. Morgan	H
89	9/15/1864			4000	Cartridges	.36	W. Morgan	H
89	9/15/1864	100	Rifles & Ammunition Therefore				O. Baxter	G
90	9/16/1864			2000	Rifle Ball Cartridges	.54	Hal Sayre	?
90	9/16/1864			1000	Sharps Ball Cartridge	.58	Hal Sayre	?
90	9/16/1864	30	"Revolvers and Equipments"				Lt. Autabees	H
90	9/16/1864			1000	Cartridges	.44	D. Nichols	D
90	9/16/1864			1000	Cartridges	.36	D. Nichols	D
90	9/16/1864			1000	Cartridges	.36	CPT Wanless	Prov. Mar.
92	9/21/1864	8	Whitney Revolvers & Equipments	200	Cartridges	.36	J. McCannon	I
92	9/21/1864	38	Austrian Rifles and Equipments	1000	Cartridges	.54	J. McCannon	I
93	9/22/1864	60	Harpers Ferry Muskets, Etc.	3000	Cartridges	.69	Lt. McDonald	H
93	9/22/1864	30	Harpers Ferry Muskets, Etc.	1200	Cartridges	.69	P. Talbot	M
94	9/24/1864			500	Cartridges	.52	Hal Sayre	?
94	9/24/1864			500	Cartridges	.44	Hal Sayre	?
96	9/28/1864	60	Citizen Rifles (Gilpin Purchase)	400	Cartridges	.69	J. Chivington	1 <sup>st</sup> Colo.
96	9/28/1864	10	Harpers Ferry Muskets	1000	Percussion Caps		J. Chivington	1 <sup>st</sup> Colo.
96	9/28/1864	8	Austrian Rifles				J. Chivington	1 <sup>st</sup> Colo.
104	10/10/1864			3000	Carbine Ball Cartridge	.54	D. Nichols	D

# ORDNANCE ISSUES TO 3<sup>RD</sup> COLORADO CAVALRY

Special Order	Date	Ordnance		Ammunition			Company
		Qty.	Description	Qty.	Description	Caliber	
109	10/17/1864			3000	Cartridges	.52	G. Shoup 3 <sup>rd</sup> Colo.
109	10/17/1864			6000	Cartridges	.44	G Shoup 3 <sup>rd</sup> Colo.
109	10/17/1864			10000	Cartridges	.36	G. Shoup 3 <sup>rd</sup> Colo.
111	10/19/1864	8	Whitney Pistols and Holsters	100	Rounds	.36	J. Phillips L
114	10/24/1864			1000	Cartridges	.36	Lt. Pennock D
114	10/24/1864			1000	Cartridges	.44	Lt. Pennock D
117	10/27/1864			800	Cartridges	.36	J. McCannon I
118	10/28/1864	6	Springfield Rifles	180	Cartridges	.58	J. Chivington 1 <sup>st</sup> Colo.
119	10/29/1864			3000	Cartridges	.58	W. Morgan C
		1035	TOTAL WEAPONS	85880	TOTAL ROUNDS		

## NOTES:

1. Special Order numbers are from Headquarters, District of Colorado
2. Per Special Order 99, October 1, 1864, Tyler's Rangers turned in 60 Mississippi rifles. 12 Garibaldi rifles, and 5000 cartridges. No Special Order issuing these but company history in muster rolls says they were issued August 17-18, 1864.
3. Special Order 133, November 14, 1864, ordered Captain Nichols, Company D, 3<sup>rd</sup> Colorado, to turn in all surplus ordnance and stores in his possession. No record what, if anything, he turned in.

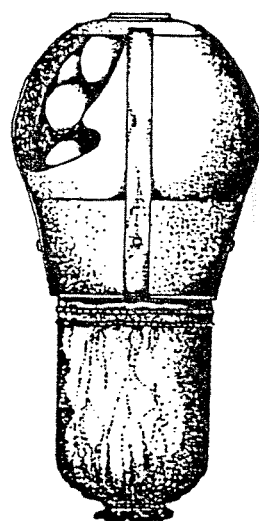


Circa 140 .69 caliber lead balls, placed in tiers and padded with sanduel.

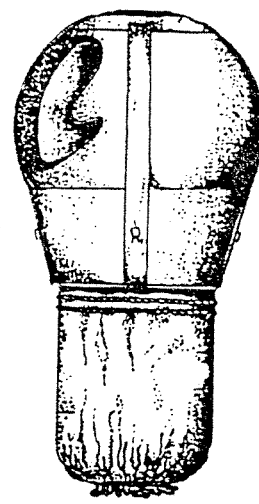
### Types of "FIXED ROUNDS"

The authorized allowance for each ammunition chest on the limber was.....

- 6 SHELL
- 1 CANISTER
- 1 SPHERICAL CASE SHOT

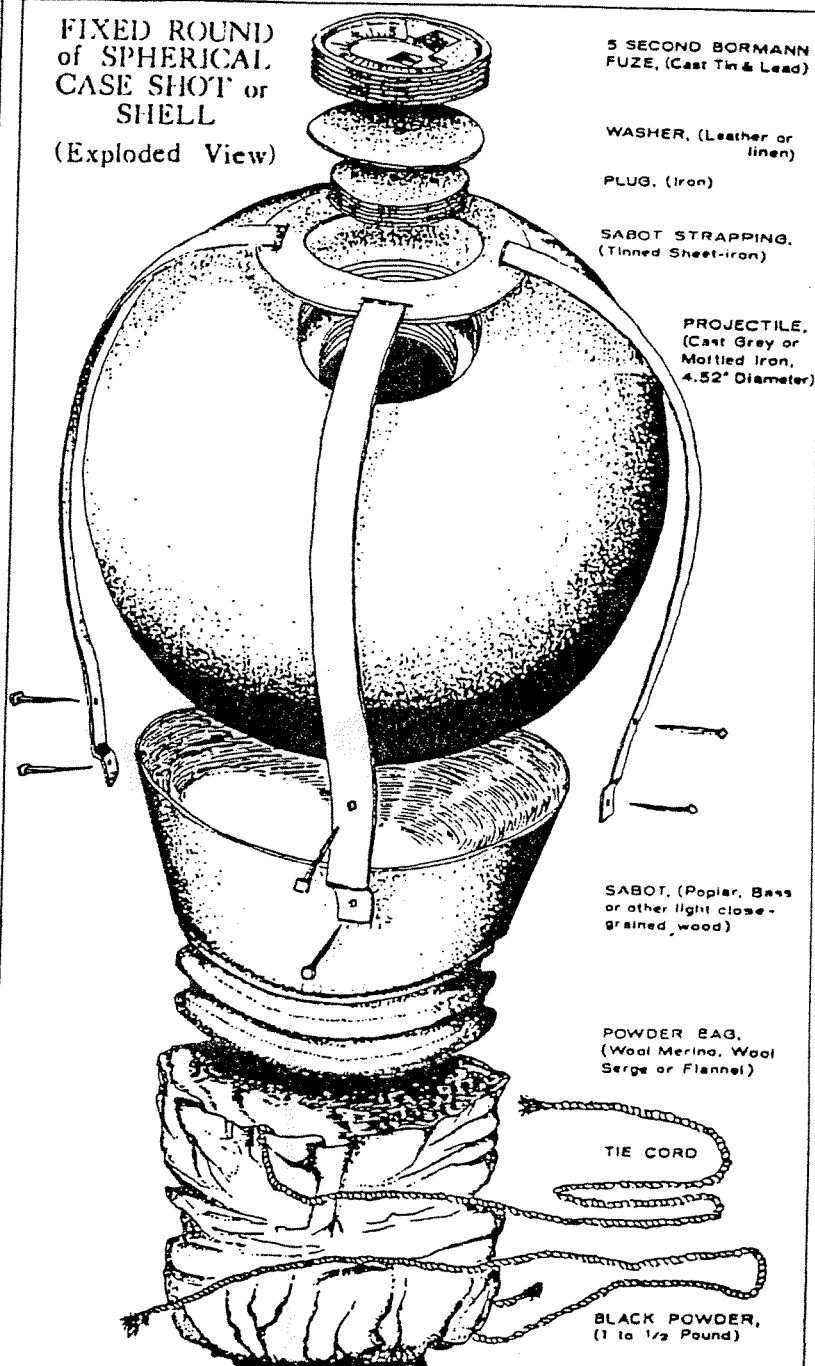


Ball painted red; sulphur powder charge



Ball lacquered black; musket powder charge

### FIXED ROUND of SPHERICAL CASE SHOT or SHELL (Exploded View)



5 SECOND BORMANN FUZE, (Cast Tin & Lead)

WASHER, (Leather or linen)

PLUG, (Iron)

SABOT STRAPPING, (Tinned Sheet-iron)

PROJECTILE, (Cast Grey or Mottled Iron, 4.52" Diameter)

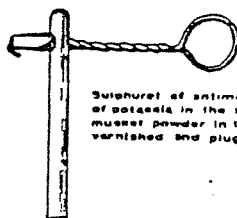
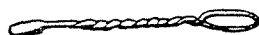
SABOT, (Poplar, Bass or other light close-grained wood)

POWDER BAG, (Wool Merino, Wool Serge or Flannel)

TIE CORD

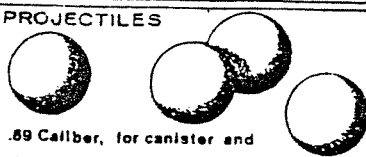
BLACK POWDER, (1 to 1 1/2 Pound)

### The FRICTION PRIMER



Sulphuret of antimony and chlorate of potassa in the short tube, and musket powder in the long tube; varnished and plugged with beeswax.

### The SUB-PROJECTILES



.69 Caliber, for canister and Spherical Case Shot

### INITIAL VELOCITIES

SPHERICAL CASE SHOT	953 FPS
CANISTER	1015 FPS
SHELL	1054 FPS

### TABLE of RANGES

Elevation	SHELL	Time	SPH'L CASE	Time
0"	170 Yards		150 Yards	
1"	300 "			
2"	390 "			
2°30'	500 "	2 Sec's	450 "	2 Sec's
3"	635 "		500 "	
4"	785 "	3 "	700 "	2.75 "
5"	1005 "		800 "	3 "

Maximum range of Canister: 250 Yards